ARIZONA TRANSPORTATION INFORMATION SYSTEM

ATIS NEWS

Volume 2, Issue 1
Summer 1998

User group now forming!

Geographic Information System (GIS): An organized collection of computer hardware, software, geographic data, and personnel designed to efficiently capture, store, update, manipulate, analyze, and display all forms of geographically referenced information.

GIS is rapidly becoming a common tool for planning, analyzing, modeling and managing information. Many analysts and planners are discovering that by integrating GIS into their current operations they can improve their service, reduce costs, enhance productivity and achieve overall success. This growing interest and use of GIS as a planning tool for many socio-economic type issues has prompted the creation of a user group. However, this user group is slightly different from other GIS user groups in that it is intended to focus in on the *attribute* side of GIS more than the geographic side. (i. e. the amount and types of accidents on I-17 as opposed to the line segments that make up I-17).

Beginning with this issue, ATIS News will broaden its scope and begin additional coverage of topics that relate to issues of interest to this user group. The current objectives of the group are:

- To provide a forum for the exchange of ideas and resources
- To promote communication and information exchange among users
- To support and promote the use of GIS as a tool for data analysis
- To provide a central point of contact for users

It's a contest!
Name the User Group!
Submit your ideas today and win!

These objectives will evolve as the group evolves. The important point is that we want your input! Please take a few moments and answer our survey on page 5 of this newsletter.

Additionally, since we are still forming this group, we do not have a name! So put your creative energies to work and submit your ideas for a name for this new user group to Jami Garrison – phone: (602) 255-8958, fax: (602) 256-7563, or email: jgarrison@dot.state.az.us.Á

Arcview extensions

Ever wonder how to create better looking legends with just a click of a button? Or how about adding a dialogue box to your layout or view? These tools and many others are available to you by simply adding a few extensions to your ArcView program. And, best of all, they come free with your ArcView 3.0x install! In this column we will show you how to add these extensions to extend your ArcView session.

First of all you need to be sure that you have these sample files installed on your system. (For this example we will assume that you kept the default directory names and installed on the 'c' drive

(Continued on page 4)

Inside this issue:

Upcoming Events

- URISA '98
  July 18-22, 1998 in Charlotte, North Carolina
- 1998 ESRI User Conference
  July 27-31, 1998 in San Diego, California
- AGIC '98 Conference
  August 10-11, 1998 at Arizona State University in Tempe, Arizona
- North American Cartographic Information Society (NACIS) 18th Annual Conference
  October 7-10, 1998 in Milwaukee, Wisconsin

(see page 4 for details)

Help Yourself to Technical Support

You've been through the 2-day ArcView class, you've reviewed your notes, reread the chapter on creating a View, but you still need help! Ugh! Now what? Before you start throwing pencils at your monitor help yourself to some free technical support from ESRI. If you have access to the internet, just point your web browser to http://www.esri.com/support/support.html. Here you will find web-based Technical Notes, user-to-user discussion forums and a chat server, plus E-mail based discussion lists. For those without immediate internet access a Fax On-Demand server is also available. All of these services are available 24 hours a day.

eb-based Technical Notes

The Technical Notes are FA s derived from the same information that ESRI technical support analysts use when responding to user calls. The FA s are organized by product and subcategories, or use the full text search feature to uickly locate the information you need.

On-line Discussion Conferences and istservers

On-line discussion conferences are available for each ESRI product. Much like posting to a bulletin board, these ongoing conferences allow you to post uestions, tips and techni ues on any aspect of an ESRI product. The conferences also include a search engine and optionally allow you to receive forum thread postings via E-mail. One point to note, though, some of the conferences re uire you to complete a one-time registration by either entering your product serial number or your end user number.

There are also two E-mail based mailing lists, or istServers, available: ESRI- and ARCVIE - . A listserver allows messages to be distributed to everyone subscribed to list by simply submitting a message to a single address. In other words, when a message is sent to the list address, it is then sent out to all subscribers of the list, each receiving a copy of the original message. ESRI- is for technical uestions about all ESRI software, except for Arcview GIS, which has its own list.

To subscribe to ESRI- , send a message to esri-l-re uest@esri.com. The body of the message must contain the word subscribe. Once subscribed, submit your uestions to esri-l@esri.com.

To subscribe to ARCVIE - , send a message to arcview-l-re uest@esri.com. The body of the message must contain the work subscribe. Once subscribed, submit your uestions to arcview-l@esri.com.

ESRI Chat Server

The ESRI chat server allows you to communicate in real time through text with other users. You can access the ESRI Chat Server at http://www.esri.com/chat. If your web browser supports Java, you can participate via the Java-based chat session or obtain freeware and shareware chat software through links provided at the site. A chat schedule is available to browse or post an announcement of a chat session you wish to host. ESRI is also anticipating using the Chat Server for scheduled technical discussions involving staff participation.

Fax On-Demand Server

The same documents available online from Technical Notes on the eb are also available via fax. The Fax On-Demand system is available to users in the United States and Canada at (909) 307-3111. You will need a touch-tone phone to access the system. Once connected, simply follow the voice prompted menus to obtain an index or to re uest up to three documents per call. The documents will be faxed to the fax number that you enter. Á

ATIS NEWS

ATIS News is published by the Arizona Department of Transportation (ADOT), Transportation Planning Group to support and promote the use of GIS in ADOT. Our Staff members are:

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Update: GIS in ADOT

Notice anything different? e've changed our look, added more content, and are forming a user group! The purpose of our newsletter has always been, and will continue to be, to provide you with information on GIS issues as they relate to ADOT and the State of Arizona.

e want to make this newsletter as helpful as possible for you, so please don't hesitate to send us your ideas, uestions and comments! All submissions should be sent to Jami Garrison using the contact information located on the back cover of this issue.

Another change since our last newsletter is the addition of a new staff member. Jami Garrison has joined the Transportation Planning Group as a Senior GIS Analyst. Jami's primary responsibilities include: the update of our base map ATIS Roads, creation of our web site, the ATIS Newsletter, and providing technical support to ADOT GIS users.

In other areas of ADOT, we are currently investigating using GIS in road feature inventory, truck routing, and airport locations. The project of geocoding of accidents, bridges and railroad crossings is steadily progressing. Additional information on these and other ADOT projects will be in upcoming issues of ATIS News. Á

The Data Hound

Tired of surfing for hours on the net in search of spatial data? Then let the Data Hound sniff out free data for you! ESRI now offers a uni ue service that catalogs and searches websites that offer freely downloadable data compatible with ESRI software. The Data Hound allows you to search for data based on geographic region, theme and/or keywords. There are 21 themes available to choose from including highways, demographics, hydrography, land use and natural resources.

ESRI GIS software directly reads the following native vector and raster formats: ARC/INFO coverages, PC ARC/INFO coverages, ESRI shapefiles (.shp), ESRI E PORT files (.e00), ESRI GENERATE files, ESRI SDE layers, and ESRI ARC GRID files. Other file formats that ESRI software can either read directly or convert include ADRG, ADS, AMS, ASRP, BI , BIP, BS , CADRG, CIB, DFAD, DBN, DIIME, D G, DTED, D G, D F, ERDAS IMAGINE, Etak, GIRAS, GRASS, GRID, IGDS, IGES, AN, andsat, MIADS, MIF, MOSS, NITF, PICT, R C, SDTS, S F, SPOT, SunRaster, TIGER, TIFF, USRP, and VPF. However, the Data Hound excludes map data in graphic formats such as GIF, EPS and CGM.

The key to the success of the Data Hound is the submission of websites by data providers. Submission of a web site is relatively simple and straight forward. The data owner has complete control over what information Data Hound posts about their site. The main stipulation is that the web site submitted must offer free downloadable data in formats usable by ESRI software. You can visit the Data Hound online at http://www.esri.com/datahound. Á

What is metadata?

Metadata are basically data about data. Metadata describe the content, uality, condition, and other characteristics of data. Metadata are used to organize and maintain data, to provide information to data catalogs and clearinghouses, and to aid data transfers. The Federal Geographic Data Committee (FGDC) approved the *Content Standard for Digital Geospatial Metadata* on June 8, 1994. Since that time, many organizations within and outside of the Federal Government have adopted the FGDC metadata standard and are using automated indexing and serving mechanisms to provide access to their holdings through the Internet.

The Arizona State Cartographer's Office was awarded a grant to establish an Arizona (metadata) Node on the National Geospatial Data Clearinghouse. The creation of metadata for the Arizona Node is currently taking place for the Arizona and Resources Information System (A RIS) database. Two students at the Arizona State University GIS ab are involved in the metadata creation. The Arizona node on the Geospatial Data Clearinghouse is expected to be activated in the near future. This initial metadata server will become a model for other Arizona participants.

To learn more about metadata, the FGDC Clearinghouse, or to search for specific geospatial data sets, visit the FGDC website at http://www.fgdc.gov/Metadata/Metadata.html Á

Problems Running ArcView

If you have been using ArcView for any time, you have probably had a hardware or software crash. Unfortunately, this is not unusual. The most common error is a segmentation violation . You may have also experienced ArcView running very slowly. The problems vary depending if you are running indows 3.11, indows 95, or indows NT.

The major cause is that ArcView is a 32-bit application while indows 3.11 is a 16-bit operating system. Although indows 95 is a big improvement over indows 3.11, problems still exist with it as well. If you are running indows NT, which is more stable than indows 95, system crashes will rarely occur (though it still happens). ADOT is in the process of migrating to NT, but until the migration is complete many of you will have to deal with the problems of indows 3.11.

So what can you do about these crashes, if anything? The best fix for segmentation violation errors is to add more RAM space. ArcView will run using 8 MB of memory but you won't get much accomplished. And even 16 MB is not enough if you want to work in ArcView with few problems. The more memory you can put in to your machine, the better. ArcView systems will run much better with 32 MB of memory or, better yet, 64 MB. Memory is relatively inexpensive, and simple to upgrade. The time lost rebooting systems and recovering data adds up to a lot more dollars than a simple memory upgrade.

Other simple solutions include deleting temporary (xxxxx.tmp) files on a regular basis. Defragging your hard drive also helps. However, be sure to use the correct defragging tools, which are dependent upon which operating system you are using. If you are unsure, check with your local PC support technician. Another performance check is your computer's swap space. Swap space is a virtual memory that is dynamically allocated on your hard drive as needed. For running ArcView your swap space should be set to at least 20MB. Swap space is set through the Control Panel on your indows operating system.

Additional solutions to hardware and software problems can be found in ESRI's eb site (http://www.esri.com) under ArcView's technical support section. Á

Expand your gis knowledge

Several upcoming conferences offer GIS users, and aspiring GIS users, opportunities to catch up on the latest technology advances in GIS, network with other GIS users, and expand your current knowledge of GIS.

URISA '98

The Urban and Regional Information Systems Association (URISA) '98 Annual Conference and Exposition is scheduled for July 18-22, 1998 in Charlotte, North Carolina. URISA is an association of 4,000 spatial data management professionals. Anyone who is responsible for making information technology and GIS work in their organization is encouraged to attend the conference to share and learn from others. The conference offers full-day workshops, technology sessions, luncheon seminars, as well as vendor displays, educational sessions and demonstrations. For more information visit URISA's website at http://www.urisa.org.

1998 ESRI User Conference

Environmental Systems Research Institute (ESRI) will host its annual User Conference in San Diego during the week of July 27-31, 1998. This is the big one the largest GIS conference in the world! The conference offers a week jam-packed with technical workshops, 600 paper presentations by successful users of ESRI software, hardware and software exhibits, regional and special interest user group meetings, and more! Find out all the details of the 18th Annual ESRI User Conference on the web at http://www.esri.com.

AGIC '98

The Arizona Geographic Information Council (AGIC) 1990 GIS conference will be held at ASU on August 10 and 11, 1998. The AGIC conference is a two day event filled with technical sessions, map displays and vendor exhibits. The AGIC conference is a great place to meet local GIS users and share knowledge. For more information on the AGIC conference, visit their website at http://www.land.state.az.us/agic/agichome.html or call them at the State and Department (602) 542-4060.

NACIS Annual Conference

The North American Cartographic Information Society is hosting its 18th annual conference October 7-10, 1998 in Milwaukee, isconsin. Specfic details are not yet available. atch for more information in the next issue of ATIS News. Á

ArcView Extensions *(continued)*

(Continued from page 1)

when you installed your ArcView 3.0x. Also, we will assume you are using indows NT). Using your NT explorer, navigate to the *c:\esri\Av_gis30\ArcView \samples\ext* directory. Here you will find a whole slug of sample extensions and projects. You'll notice that there are three different files for each extension, a .apr, .avx, and .hdr. The .apr files are arcview project files with the Avenue scripts loaded that make up the extension. For example, the maptools.apr project has all the Avenue scripts loaded to perform the same tasks that the extension has. The .avx file is the ArcView extension file. The advantage to using an extension over a project file with scripts loaded is that you can easily add in customizations without having to copy an entire project file. Extensions are easily loaded from the project menu, as we will soon demonstrate. The .hdr files are a simple description of what the tools (extension or scripts in the project file) are designed to do.

For this example we will load the Avlabel extension. Find the file *avlabel.avx* and copy it into the directory *c:\esri\Av_gis30 \Arcview\ext32*.

Now start an ArcView session. From the ***File*** menu select ***Extensions.*** A window will pop up and in the box labeled Available Extensions you should now see ***Labeling*** as one of the options. Select it by putting a check in the box to the left of it. Click ***okay.*** You have now added in the ArcView labeling extension. This extension adds two tool menus (buttons) to your View GUIs and one tool menu (button) to your ayout GUIs. These tools allow you to label individual features with labels that contain additional graphics like leaders, backgrounds, shadows or both. The icons for each tool indicate approximately what the result will be.

For View GUIs, there will now be two additional tool buttons. The first button contains tools that will label the feature of the active theme(s) that you click on. Additionally, by holding down the shift key as you click and drag, you can select the text, box and shadow colors for the graphic labels.

The second button is for adding text that you must enter in the ***Text Properties*** window. For tools that create leaders (or lines), click on the feature you want to label and then drag in the direction you want the label to appear. This button is also available in the ayout GUI with the same functions as in the View GUI. This button also allows you to select the colors if you hold the shift key down as you click and drag.

Each new label that is created on the ayout or the View is a graphic group. This means that you may select the group and then use the symbol window to change its colors. Foreground only changes the foreground color, background only changes the background color, the outline changes the outline color, and text changes the text color.

One important note is that these are samples and thus are subject to 'bugs.' e discovered a few flaws while using the Avlabel extension, such as the color options didn't always come up when you held the shift key. Another flaw that came up in the ayout GUI was when we selected text only (no leader) the text appeared behind our view. e had to move the graphic to the front before it became visible. Nevertheless the ability to create some nice looking labels makes this extension worth a try.

In our next issue we will look at the Maptools extension for adding multi-column legends, neatlines and graticules to your Views and ayouts. See page 6 for a listing of sample extensions. Á

User Group Survey

If you are interested in being a part of, or have already indicated that you want to be a part of the GIS User Group, please take a few moments to answer this survey. Whether or not we forge ahead with the User Group will depend on the response we get! Thank you! (attach additional sheets if necessary)

1. How do you use GIS (i.e. for what type of applications, give project examples if necessary)? Or, if you currently do not use GIS, but have an interest in using GIS sometime in the near future, explain how you would like to use GIS in your current activities.

   _____
   _____
   _____
   _____
   _____

2. What would you like to get out of the GIS User Group? (circle the letter of all that apply)
   a. Idea exchange with other Socio-Economic GIS users
   b. Resource sharing (i.e. data)
   c. Better knowledge of GIS – be able to use its full potential
   d. other (Please list any additional items)

   _____
   _____

3. How would you like to interact with the User Group? (circle the letter of all that apply)
   a. email (through a listserv or email group)
   b. get information from the User Group webpage (once created, of course!)
   c. get information from the User Group newsletter (printed version, will also be available online)
   d. regular User Group meetings
   e. User Group meetings scheduled only as necessary
   f. Other _____

4. What topics would you like to see covered in our newsletter and on the webpage? (circle the letter of all that apply)
   a. technical GIS tips and techniques
   b. data resources (i.e. how and where to get data)
   c. socio-economic applications involving GIS
   d. spotlight on how User Group members use GIS
   e. upcoming seminars and training opportunities
   f. please list additional ideas you may have:

   _____
   _____

5. Please give any additional comments, suggestions, ideas or questions that you may have regarding the User Group:

   _____
   _____
   _____
   _____

One last request… please give us your contact information so that we can be sure your information is current in our database.

Name _____

Organization _____

Mailing address _____

City _____ State _____ Zip _____

Email _____

Phone (_____)_____ Fax (_____)_____

Thank you! You may either fax this form to 256-7563 attn: Jami Garrison, email your responses to us at *jgarrison@dot.state.az.us,* or mail this form to Socio-Economic GIS User Group, c/o Jami Rae Garrison, ADOT-TPG, 206 S 17th Ave #330B, Phoenix, AZ 85007-3213. Direct any questions to Jami Garrison at (602) 255-8958 or jgarrison@dot.state.az.us Á

Sample ArcView Extensions

The following is a list of sample extensions that come with ArcView 3.0a. Assuming you loaded ArcView into the default directories, these files can be found in *c:\esri\AV_gis30\arcview\samples\ext* on your computer. If you do not have any of the ones listed, these and others are available free from ESRI's website at *http://andes.esri.com/arcscripts/scripts.cfm*. Each extension also comes with the Avenue scripts that make up the extension.

⇒ Avlabel – abeling contains tools for labeling and adding text to layouts and views.

⇒ Buffer – Buffering adds a button that you can use to place buffers around the selected features based on a distance you specify.

⇒ Clsbrwsr – Class browser provides some tools for working with the list of re- uests in ArcView 3.0 and the list of changed re uests.

⇒ Datum – Datum Conversion provides scripts you can use to convert datums.

⇒ Extbuild – Extension Builder This is a very helpful extension that HE PS you to create your own extensions.

⇒ Hydro – Hydrologic Modeling Extends the spatial analyst user interface for hydrologic modeling. This extension re uires the Spatial Analyst Extension.

⇒ ast4 – Saves the names of the last four saved project files. From the Project's File menu, click on the name of a project file to open it.

⇒ Maptools – contains tools for making maps (graticules, neatlines, legends).

⇒ Namedext – Named Extents Allows you to create and use named extents in Views.

⇒ Overview – Allows you to create overviews. An Overview view is a small view that displays the full extent of the current view and a rectangle outlining its extent.

⇒ Portprj – Port Project Utilities This extension provides utilities that make it easier to move projects from machine to machine. Adds the menu Port to the project DocGUI which contains two utilities that simplify porting a project.

⇒ Prjctr – Projector! This extension allows conversion of data between map projections.

⇒ Sde-edit – SDE Editing Provides sample tools for editing SDE layers.

⇒ Sedtools – Script Editor Utilities Provides a number of utilites you can use when writing scripts.

⇒ Seesmple – Samples Browser Installs controls to your Project and Script DocGUIs to simplify access to samples.

⇒ Slc – Speed imit Calculator Use speed limit data to compute line traversal times. Re uires the Network Analyst Extension.

⇒ Tablex – ODB Table extension This replaces three system scripts to write out and use an ODB file to hold the table aliases for DBF files (these include shapefile attributes).

⇒ Vdocutil – Virtual Document Utilities Provides utilities for working with virtual documents such as associating Docs with DocGUIs and grouping Docs on the project window.

⇒ Vistools – Visibility Tools Provides samples which do line of sight analysis, profiles, and visibility.

Note that there are three files for each extension. The *.hdr* file is a text file containing a description of the extension, the *.avx* is the extension file, and the *.apr* file is a project file that has the scripts loaded that make up the extension.

Along with extensions, the ESRI website also has many scripts available for downloading. Additionally, if you have an extension that you have built or some helpful scripts you've written, you can upload them to ESRI for distribution through the website. Á

GIS SPEAK

Before you attend your next GIS conference brush up on your GIS lingo. Here are a few definitions that every aspiring GIS analyst should know!

Datum – A set of parameters and control points used to accurately define the three dimensional shape of the Earth (e.g. as a spheroid). The corresponding datum is the basis for a planar coordinate system. For example, the North American Datum for 1983 (NAD83) is the datum for map projections and coordinates within the United States and throughout North America.

DEM – Digital Elevation Model. 1) A topographic surface arranged in a data file as a set of regularly-spaced x,y,z locations where z represents elevation. 2) An elevation database for elevation data by map sheet from the National Mapping Division of the U.S. Geological Survey (USGS). 3) The format of the USGS digital elevation data sets.

Geocode – The process of identifying a location by one or more x,y coordinates from another location description such as an address. For example, an address can be matched against a TIGER street network to determine the location of a home.

GPS – Global Position System. A satellite-based device that records x,y,z coordinates and other data. GPS devices can be taken into the field to record data while driving, flying, or hiking. Ground locations are calculated by signals from satellites orbiting the earth.

Quad – (uandrangle) Typically refers to a map sheet published by the USGS, in the 7.5-minute uadrangle series or the 15-minute uadrangle series. Also known as a *topographic* or *topo* map.

Topographic Map – A map containing contours indicating lines of e ual surface elevation (relief), often referred to as *topo maps*. (see also *Quad*)

TIGER – The Topologically Integrated Geographic Encoding and Referencing data format used by the U.S. Census Bureau to support census programs and surveys. It was used for the 1990 Census. TIGER files contain street address ranges along with lines and census tract and block boundaries. This descriptive data can be used to associate address information and census or demographic data with coverage features. Á

ESRI Products in state government

The State Procurement Office has recently announced that ESRI products are now available on State Contract. This means that the purchasing of ESRI GIS products just got easier. Because each State Agency has different purchasing guidelines and procedures, check with your purchasing specialist before ac uiring an ESRI product. Or, direct your uestions to the State Procurement Office at (602) 542-5511.

In related news, the Government Information and Technology Agency (or GITA) is establishing a GIS software standard for State of Arizona Agencies. The standard will apply to GIS development software as well as desktop uery and mapping software, and GIS bundled desktop applications.

Currently the de facto state software standard for GIS products is the ESRI suite of products. ESRI products are the only ones used by agencies which currently do extensive GIS development in state government. Additionally, ESRI's desktop uery and mapping software, ArcView, is the most widely used by state agencies consisting of over 100 licenses of the package being held by state agencies.

So what does all this mean to State Agencies? Basically, if you're just getting started with GIS, the logical choice would be an ESRI product since there already exists a huge support base from current GIS users. Another benefit is the ability to instantly share spatial data. Many state agencies have a database of Arc/Info coverages and ArcView shapefiles that are readily available for use by other state agencies. You won't have to start from scratch, as many base maps and coverages have already been created. For example, land use data can be obtained from the State and Department, and hydrology and watershed areas can be obtained from the Department of ater Resources.

Creating a software standard for GIS can be an important step for Arizona State government. This is because GIS is a very interdependent technology. Most implementations of GIS re uire considerable interaction with other agencies in order to be successful. The success of GIS in Arizona state government can be attributed to the strong interaction and cooperation among GIS users in various state agencies. A software standard would provide one more positive step towards a successful GIS community in Arizona. Á

Worthy websites

The Arizona State and Department has loads of information on their website at http://www.land.state.az.us/. From the main page you can browse through the various divisions within the department, from Administration to Natural Resources to Fire Management and more. For GIS related information you'll definitely want to check out the Arizona and Resource Information System (A RIS) area. Here you can see what type of GIS data is available (they have a huge database!) as well as check on the status of any GIS classes being offered. (A RIS teaches certified courses in Arc/Info, ArcView and more).

The other GIS-related area of interest on the State and Department's website is the Arizona Geographic Information Council (AGIC). AGIC coordinates the development and management of GIS and geographic data in Arizona. Made up of representatives from State, ocal, Federal and Private industries, AGIC promotes the use of GIS and related technologies. You can also find information about the upcoming Annual AGIC conference on their website.

The Pima County Department of Transportation, Technical Services Division offers many GIS services on their website at http://www.dot.co.pima.az.us/gis/. Highlights from this site include:

- a nice overview of GIS, including a GIS tutorial
- Geographic Maps and Drawings where you can create a semi-custom map in your browser based on selected criteria
- Information about GIS services and projects at Pima DOT
- Developing GIS topics include useful information on internet development with GIS, using Arc/Info in indows NT, and Arc/Info 7.1.1 problems and solutions
- inks to other interesting GIS websites

If you have a favorite GIS related website, email us the URL to jgarrison@dot.state.az.us. We ll highlight GIS related websites in each issue of ATIS News. Á

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ArcView Training

ADOT provides ESRI certified training three times a year at no or little cost for ADOT employees. The same certified class is available through private entities for around 350. A list of certified instructors can be found on ESRI's internet web site at http://www.esri.com.

There are about 13 certified instructors in Arizona as well as two ESRI Authorized earning Centers: Mesa Community College (602-461-6105) and MRJ Technology Solutions in Tucson (520-326-7005). ESRI also provides a virtual campus on their internet site where you can learn the basics of ArcView at your own pace through the internet. Or if you prefer, self-paced training manuals can be purchased on the internet from On- ord Press at http://www.onwordpress.com (search their catalogue by subject area: ArcView). Á

In our next issue...

Real World GIS – GIS User Stories see how GIS is used in a Real orld application.

GIS on the internet – ADOT is going global with GIS! Soon we'll have interactive maps on our website for anyone with internet access to see! Powered by ArcView Internet Map Server, with a java-enable browser you'll be able to view our maps interactively. Zoom in, zoom out, select your themes and identify features!

Results of our survey will be in the next issue. Turn your survey in today! (see page 5) Á